

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401**

**ORDER NO. R3-2004-0005
WASTE DISCHARGE REQUIREMENTS
NPDES NO. CA0049697**

for

**CITY OF MORRO BAY DESALINATION FACILITY
SAN LUIS OBISPO COUNTY**

The California Regional Water Quality Control Board, Central Coast Region (Regional Board), finds that:

SITE OWNER AND LOCATION

1. The City of Morro Bay (Discharger) owns and operates a reverse osmosis seawater desalination facility at 176 Atascadero Road, Morro Bay, as shown on Attachment A.

PURPOSE

2. The Discharger submitted an application for permission to continue discharging wastes under the National Pollutant Discharge Elimination System (NPDES) on September 30, 2003.
3. These Waste Discharge Requirements are being revised and updated to replace Order No. 94-03, "Waste Discharge Requirements for City of Morro Bay Desalination Facility, San Luis Obispo County," adopted by the Regional Board March 11, 1994, and administratively extended April 9, 1999 until March 11, 2004.

FACILITY DESCRIPTION

4. The primary water supplies of the City of Morro Bay are the State Water Project and groundwater. The desalination facility is used as backup municipal potable water supply during emergency drought conditions or when primary supplies are not available, such as

when the State Water Project is shutdown each fall for maintenance.

5. Source water is pumped from a gallery of five beach wells located at the north end of Embarcadero Avenue, near Coleman Park, as shown on Attachment A, and brackish wells adjacent to Morro Creek. This source water collection method avoids impingement and entrainment of aquatic life, and minimizes pretreatment of the source water. Source water salinity is typically much less than seawater (less than 34,000 milligrams per liter (mg/L) Total Dissolved Solids (TDS)).
6. The desalination process is shown in Attachment B. Up to 1.43 million gallons per day (MGD) of source water is filtered to remove particulates and excessive iron. An anti-scaling compound such as "Flocon 100" or "Permatreat 191" may then be added. The water is then fed at high pressure through the reverse osmosis vessels. Potable water permeates through the reverse osmosis membranes and is captured. Salty water ("concentrate") is left behind by the reverse osmosis membranes.
7. Up to 830,000 gpd of wastewater is generated by the desalination facility. Wastewater consists primarily of concentrated source water, with minute volumes of clarified pretreatment filter backwash (containing particulates and oxidized iron) and up to 10 mg/L of anti-scaling compound. Effluent salinity is typically less

than or comparable to seawater. The highest effluent salinity observed since the facility began operating was 35,000 mg/L TDS in Fall 2002. The reverse osmosis membranes must be cleaned periodically. This cleaning waste is discharged to the municipal sewer system.

8. Wastewater from the desalination facility is discharged by an outfall diffuser system to the Duke Energy Power Plant cooling water outfall, approximately 100 to 150 feet upstream of where the cooling water outfall reaches the Pacific Ocean, as shown in Attachment C. Duke Energy Power Plant's outfall discharges to the Pacific Ocean adjacent and north-northeasterly of Morro Rock (35°22'15" N. Latitude, 120°51'56" W. Longitude), as shown on Attachment A.
9. Discharge of up to 725 MGD of seawater used for cooling is regulated by Waste Discharge Requirements Order No. 95-28, Pacific Gas and Electric Company (former owner) Morro Bay Power Plant, adopted by this Regional Board March 10, 1995.
10. Duke Energy Power Plant has agreed to:
"...undertake reasonable effort to provide a flow rate of a minimum of one hundred (100) million gallons per day, when City's desalination plant is operating at full capacity. The proper flow rate may be less and is determined based on the operating capacity of City's desalination plant. The flow rate provides for mixing and dispersion, to mitigate the level of total dissolved solids of City's desalination plant when said effluent discharge is above thirty four thousand (34,000) milligrams per liter (mg/L). For the purpose of this agreement, City's effluent concentration shall be presumed to exceed thirty four thousand (34,000) mg/L at all times, unless and until City notifies [Duke Energy], otherwise. In the event [Duke Energy] does not need to discharge at said flow rate for its own purposes, City shall reimburse, to [Duke Energy], [Duke Energy's] costs for the additional pumping..."
11. The desalination facility discharge constitutes less than one percent of Duke Energy Power

Plant's cooling water discharge and does not significantly alter the salinity of the combined discharge. Therefore, the initial dilution ratio applicable to the desalination facility discharge is 10.4:1 (seawater:effluent), as listed in Waste Discharge Requirements Order No. 95-28.

12. The Environmental Protection Agency and Regional Board classify this discharge as a minor discharge (less than 1.0 MGD).

RELEVANT REGULATIONS

13. The *Water Quality Control Plan, Central Coastal Basin* (Basin Plan) incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State waters. The Regional Board adopted the Basin Plan on September 8, 1994.
14. The *Water Quality Control Plan, Ocean Waters of California – California Ocean Plan* (Ocean Plan) governs discharges to the Pacific Ocean. The State Water Resources Control Board (State Board) adopted and the U.S. Environmental Protection approved amendments to the Ocean Plan most recently on December 3, 2001.

BENEFICIAL USES

15. Existing and anticipated beneficial uses of the Pacific Ocean in the vicinity of the discharge include:
 - a. Water contact recreation;
 - b. Non-contact water recreation, including aesthetic enjoyment;
 - c. Industrial water supply;
 - d. Navigation;
 - e. Marine habitat;
 - f. Shell fish harvesting;
 - g. Mariculture;
 - h. Preservation of Rare and Endangered Species;
 - i. Fish migration;
 - j. Fish Spawning; and,
 - k. Ocean commercial and sport fishing.

MONITORING AND REPORTING PROGRAM

16. Monitoring and Reporting Program No. R3-2004-0005 (MRP) is a part of this Order (see Attachment D). The MRP requires extensive monitoring of influent and effluent from the desalination facility.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

17. An Environmental Impact Report was completed for the desalination facility and certified by the City of Morro Bay on April 22, 1993, in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and the California Code of Regulations. Mitigation measures to prevent nuisance and assure protection of beneficial uses of the receiving waters will be implemented through this Order. The proposed action is not expected to reduce water quality; therefore complete antidegradation analysis is not required for the issuance of this Order.
18. Waste discharge requirements for this discharge are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21100, et seq.) in accordance with section 13389 of the California Water Code.

GENERAL FINDINGS

19. A permit and the privilege to discharge waste into waters of the State is conditional upon the discharge complying with provisions of Division 7 of the California Water Code and of the Clean Water Act (as amended or as supplemented by implementing guidelines and regulations) and with any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisance. This Order shall serve as a National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act. Compliance with this Order should assure conditions are met and mitigate any potential changes in water quality due to its operation.

20. The discharge authorized in this permit is expected to maintain receiving water quality and associated beneficial uses of the receiving waters. Discharge in accordance with limitations and specifications of this permit is not expected to degrade water quality. Accordingly, this permit is consistent with the requirements of State Water Resources Control Board Resolution No. 68-16 (commonly called the anti-degradation policy).
21. Section 13385(h) et seq. of the California Water Code requires the Regional Board to impose mandatory penalties for certain effluent limit violations. Section 13385(h) et seq. applies to effluent discharged to the ocean from this Discharger.
22. 40 CFR Section 122.44(l) requires effluent limitations for reissued NPDES permits be at least as stringent as the previous permit, unless certain grounds for "backsliding" apply. All effluent limitations in the proposed Order are at least as stringent as the previous permit and comply with Anti-Backsliding provisions.
23. On December 9, 2003, the Regional Board notified the Discharger and interested agencies and persons of its intent to reissue waste discharge requirements for the discharge and has provided them with a copy of the proposed Order and an opportunity to submit written views and comments, and scheduled a public hearing.
24. In a public hearing on May 14, 2004, the Regional Board heard and considered all comments pertaining to the discharge and found this Order consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in Section 13263 and 13377 of the California Water Code, that the City of Morro Bay, its agents, successors and assigns, may discharge waste from its Desalination Facility to the Pacific Ocean, providing compliance is maintained with the following:

All technical and monitoring reports submitted pursuant to this Order are required pursuant to Section 13267 and 13383 of the California Water Code. Failure to submit reports in accordance with schedules established by this Order, attachments to this Order, or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer, may subject the discharger to enforcement action pursuant to Section 13268 and 13385 of the California Water Code. The Regional Board will base all enforcement actions on the date of Order adoption.

Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with California Water Code Section 13320, and Title 23, California code of Regulations, Section 2050. The State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, CA 95812, must receive the petition by June 14, 2004. Copies of the law and regulations applicable to filing petitions will be provided upon request

(Note: General permit conditions, definitions and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for National Pollutant Discharge Elimination System Permits," dated January 1985)

Throughout these requirements, footnotes are listed to indicate the source of requirements specified. Requirement footnotes are as follows:

A = Ocean Plan

B = Basin Plan

Requirements not referenced are based on staff's professional judgement.

A. DISCHARGE PROHIBITIONS

1. Discharge of desalination wastewater at a location other than 35°22'15" N. Latitude, 120°51'56" W. Longitude, is prohibited.
2. Discharge of filter backwash or chemical additives, except as described in this Order, is prohibited.

B. EFFLUENT LIMITATIONS

1. Effluent daily dry weather flow shall not exceed a monthly average of 830,000 gpd.
2. Effluent shall not exceed the following limits:^A

a.

Constituent	Units of Measurement	30-day Average	7-Day Average	Daily Maximum
Net Total Suspended Solids Increase	mg/L	60	--	--
Grease and Oil	mg/L	25	40	75
	lbs/day	173	277	519
	kg/day	78	126	235
Settleable Solids	mL/L	1.0	1.5	3.0
Turbidity	NTU ¹	75	100	225
pH	Within the limits of 6.0 and 9.0 pH units at all times			

b.²**Protection of Marine Aquatic Life**

Constituent	Units of Measurement	6-Month Median	Daily Maximum	Instantaneous Maximum
Arsenic	mg/L	0.06	0.33	0.88
Cadmium	mg/L	0.01	0.05	0.11
Chromium(Hex) ³	mg/L	0.02	0.09	0.23
Copper	mg/L	0.01	0.12	0.32
Lead	mg/L	0.02	0.09	0.23
Mercury	µg/L	0.45	1.82	4.55
Nickel	mg/L	0.06	0.23	0.57
Selenium	mg/L	0.17	0.68	1.71
Silver	mg/L	0.01	0.03	0.08
Zinc	mg/L	0.14	0.83	2.20
Cyanide ⁴	mg/L	0.01	0.05	0.11
Total Chlorine Residual	mg/L	0.02	0.09	0.68
Ammonia (as N)	mg/L	6.84	27.36	68.40
Acute Toxicity	TUa	--	0.61	--
Chronic Toxicity	TUc	--	11.40	--
Phenolic Compounds (non-chlorinated)	mg/L	0.34	1.37	3.42
Chlorinated Phenolics	mg/L	0.01	0.05	0.11
Endosulfan ⁵	µg/L	0.10	0.21	0.31
Endrin	µg/L	0.02	0.05	0.07
HCH ⁶	µg/L	0.05	0.09	0.14

¹ Nephelometric Turbidity Units² These effluent limitations are based on Ocean Plan criteria using a minimum initial dilution of 10.4:1 (seawater:effluent). If actual dilution is found to be less than this 10.4:1, these effluent limitations will be recalculated and this Order revised:³ Dischargers may at their option meet this objective as a total chromium objective.⁴ If a discharger can demonstrate to the satisfaction of the Regional Board (subject to EPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, effluent limitations for cyanide may be met by the combined measurement of free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanide complexes.⁵ Endosulfan shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.⁶ HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

Constituent	Units of Measurement	6-Month Median	Daily Maximum	Instantaneous Maximum
Radioactivity	Not to exceed limits specified in California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253. Reference to Section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			

Protection of Human Health – Non-Carcinogens

Constituent	30-Day Average (µg/L)
acrolein	2500
antimony	13700
bis(2-chloroethoxy) methane	50.16
bis(2-chloroisopropyl) ether	13700
chlorobenzene	6500
chromium (III)	2170000
di-n-butyl phthalate	39900
dichlorobenzenes ⁷	58100
diethyl phthalate	376000
dimethyl phthalate	9350000
4,6-dinitro-2-methylphenol	2510
2,4-dinitrophenol	45.6
ethylbenzene	46700
fluoranthene	171
hexachlorocyclopentadiene	661
nitrobenzene	55.9
thallium	22.8
toluene	969000
tributyltin	0.016
1,1,1-trichloroethane	6160000

Protection of Human Health – Carcinogens

Constituent	30-Day Average (µg/L)
acrylonitrile	1.14
aldrin	0.00025
benzene	67.3
benzidine	0.00079
beryllium	0.38
bis(2-chloroethyl) ether	0.51
bis(2-ethylhexyl) phthalate	39.90
carbon tetrachloride	10.30
chlordane ⁸	0.00026

⁷ Dichlorobenzenes shall mean the sum of 1,2- and 1,3-dichlorobenzene.

⁸ Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

Constituent	30-Day Average (µg/L)
chlorodibromomethane	98.04
chloroform	1480
DDT ⁹	0.0019
1,4-dichlorobenzene	205
3,3'-dichlorobenzidine	0.09
1,2-dichloroethane	319
1,1-dichloroethylene	10.30
dichlorobromomethane	70.70
dichloromethane	5130
1,3-dichloropropene	101
dieldrin	0.00046
2,4-dinitrotoluene	29.6
1,2-diphenylhydrazine	1.82
halomethanes ¹⁰	1480
heptachlor	0.00057
heptachlor epoxide	0.00023
hexachlorobenzene	0.00239
hexachlorobutadiene	160
hexachloroethane	28.50
isophorone	8320
N-nitrosodimethylamine	83.20
N-nitrosodi-N-propylamine	4.33
N-nitrosodiphenylamine	28.50
PAHs ¹¹	0.10
PCBs ¹²	0.00022
TCDD equivalents ¹³	0.000000045
1,1,2,2-tetrachloroethane	26.20
tetrachloroethylene	22.80
toxaphene	0.00239
trichloroethylene	308
1,1,2-trichloroethane	107
2,4,6-trichlorophenol	3.310
vinyl chloride	410

⁹ DDT shall mean the sum of 4,4'DDT, 2,4'DDT, 4,4'DDE, 2,4'DDE, 4,4'DDD, and 2,4'DDD.

¹⁰ Halomethanes shall mean the sum of bromoform, bromomethane (methyl bromide), and chloromethane (methyl chloride).

¹¹ PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo(a)pyrene, chrysene, dibenzo(ah)anthracene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.

¹² PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

¹³ TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans(2,3,7,8-CDFs) multiplied by their respective toxicity factors, as listed in Appendix I of the Ocean Plan.

- c. During any 24-hour period, the effluent mass emission rate shall not exceed the "Maximum Allowable Daily Mass Emission Rate."
 - d. The Discharger shall report violations of the "Instantaneous Maximum" or "Maximum Allowable Daily Emission Rate" to the Executive Officer within 24 hours.
 - e. During any six-month period, the effluent mass emission rate shall not exceed the "Maximum Allowable Six-Month Median Mass Emission Rate."
3. Effluent shall be essentially free of materials and substances that:^A
- a. float or become floatable upon discharge;
 - b. may form sediments which degrade benthic communities or other aquatic life;
 - c. accumulate to toxic levels in marine waters, sediments, or biota;
 - d. decrease the natural light to benthic communities and other marine life; or
 - e. result in aesthetically undesirable discoloration of the ocean surface.

C. RECEIVING WATER LIMITATIONS

(Receiving water quality is a result of many factors, some unrelated to the discharge. This permit considers these factors and is designed to minimize the influence of the discharge to the receiving water.)

The discharge shall not cause:

- 1. Floating particulates and grease and oil to be visible on the ocean surface.^A
- 2. Aesthetically undesirable discoloration of the ocean surface.^A
- 3. Significant reduction of transmittance of natural light in ocean waters outside the "zone of initial

dilution."^A

- 4. Change in the rate of deposition of inert solids and the characteristics of inert solids in ocean sediments such that benthic communities are degraded.^A
- 5. The dissolved oxygen concentration outside the "zone of initial dilution" to fall below 5.0 mg/L^B or to be depressed more than 10 percent from that which occurs naturally.^A
- 6. The pH outside the "zone of initial dilution" to be depressed below 7.0, raised above 8.5,^B or changed more than 0.2 units from that which occurs naturally.^A
- 7. Dissolved sulfide concentrations of waters in and near sediments to significantly increase above that present under natural conditions.^A
- 8. Concentrations of the same substances listed in Effluent Limitation No. 2 to increase in marine sediments to levels which would degrade indigenous biota.^A
- 9. Objectionable aquatic growth or degradation of indigenous biota.^A
- 10. Concentrations of organic materials in marine sediments to increase to a level which would degrade marine life.^A
- 11. Degradation of marine communities, including vertebrate, invertebrate, and plant species.^A
- 12. Alteration in natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption.^A
- 13. Concentrations of organic materials in fish, shellfish or other marine resources used for human consumption to bioaccumulate to levels that are harmful to human health.^A
- 14. Degradation of marine life due to radioactive waste.^{A, B}
- 15. Temperature of the receiving water to adversely affect beneficial uses.^B

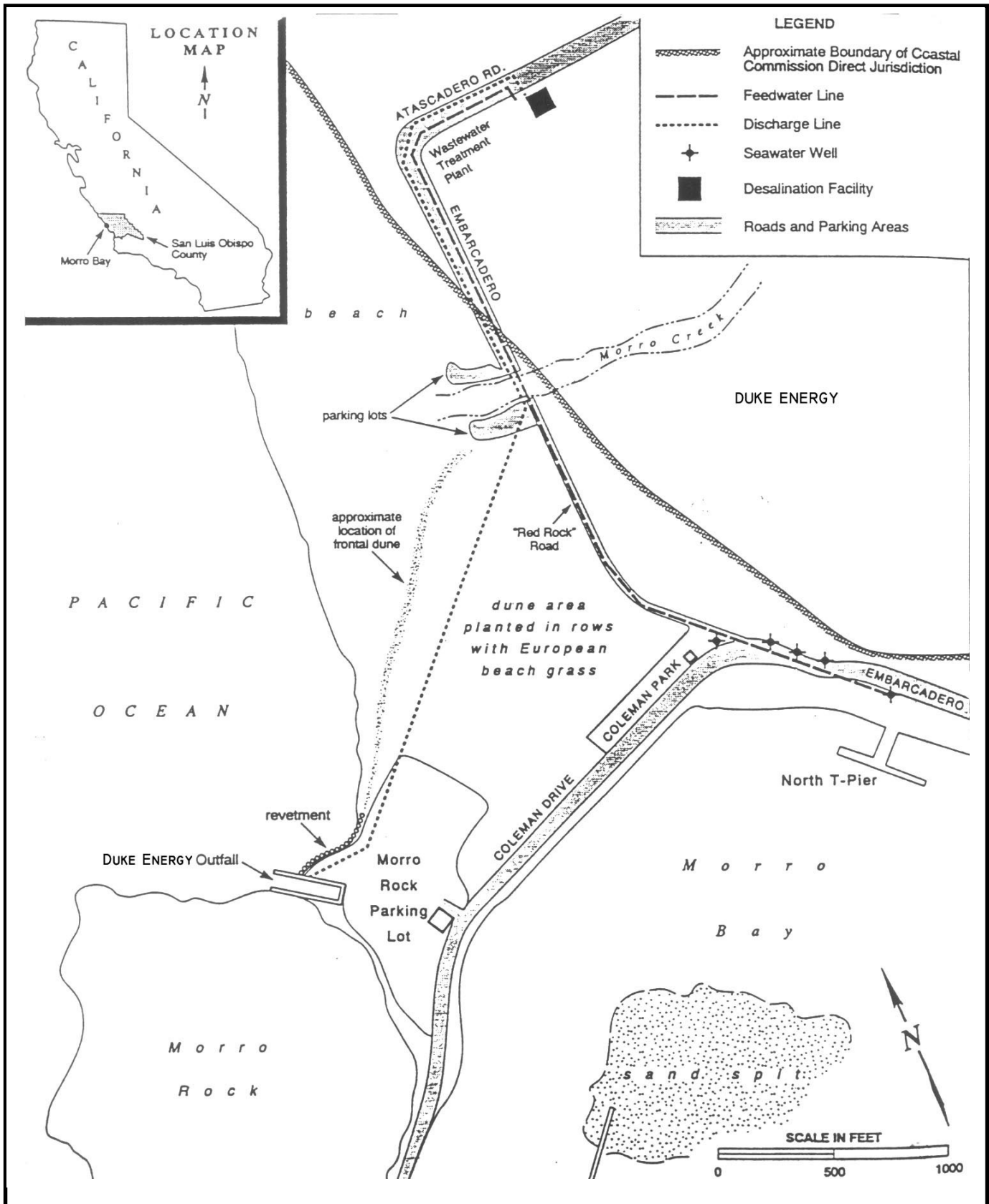
D. PROVISIONS

1. Discharger shall submit to the Executive Officer by **October 14, 2004**, a scope of work for a feasibility study of desalination wastewater discharge alternatives to the Duke Energy Power Plant cooling water discharge. The study shall evaluate at least three desalination wastewater discharge alternatives, including the wastewater treatment facility outfall. If the study will include continued use of the existing discharge location after the once-through cooling water discharge is eliminated, the study shall include the results of the dilution survey required by Section C of Monitoring and Reporting Program No. R3-2004-005. The report shall discuss technical and financial constraints, approximate dilution values, and anticipated environmental impacts associated with each discharge alternative. A final report shall be submitted to the Executive Officer by **February 11, 2005**. The final report shall include a recommendation on the best discharge alternative should the Duke Energy Power Plant cooling water discharge be eliminated.
2. The requirements prescribed by this Order supersede requirements prescribed by Order No. 94-03. Order No. 94-03 is hereby rescinded.
3. If the discharge consistently exceeds Acute Toxicity or Chronic Toxicity effluent limitations, a toxicity reduction evaluation (TRE) is required. The TRE shall include all reasonable steps to identify the source of toxicity. Once the source(s) of toxicity is identified, the Discharger shall take all reasonable steps necessary to reduce toxicity to the required level.
4. Discharger shall comply with "Monitoring and Reporting Program No. R3-2004-0005", as ordered by the Executive Officer.
5. Discharger shall comply with the attached "Standard Provisions and Reporting Requirements for National Pollutant Discharge Elimination System Permits", dated January 1985.
6. This Order expires **May 14, 2009**, and the Discharger must file a Report of Waste Discharge in accordance with Title 23, Division 3, Chapter 9, of the California Code of Regulations, no later than **November 14, 2008**, if it wishes to continue the discharge.
7. This Order is effective as of the date it is issued.

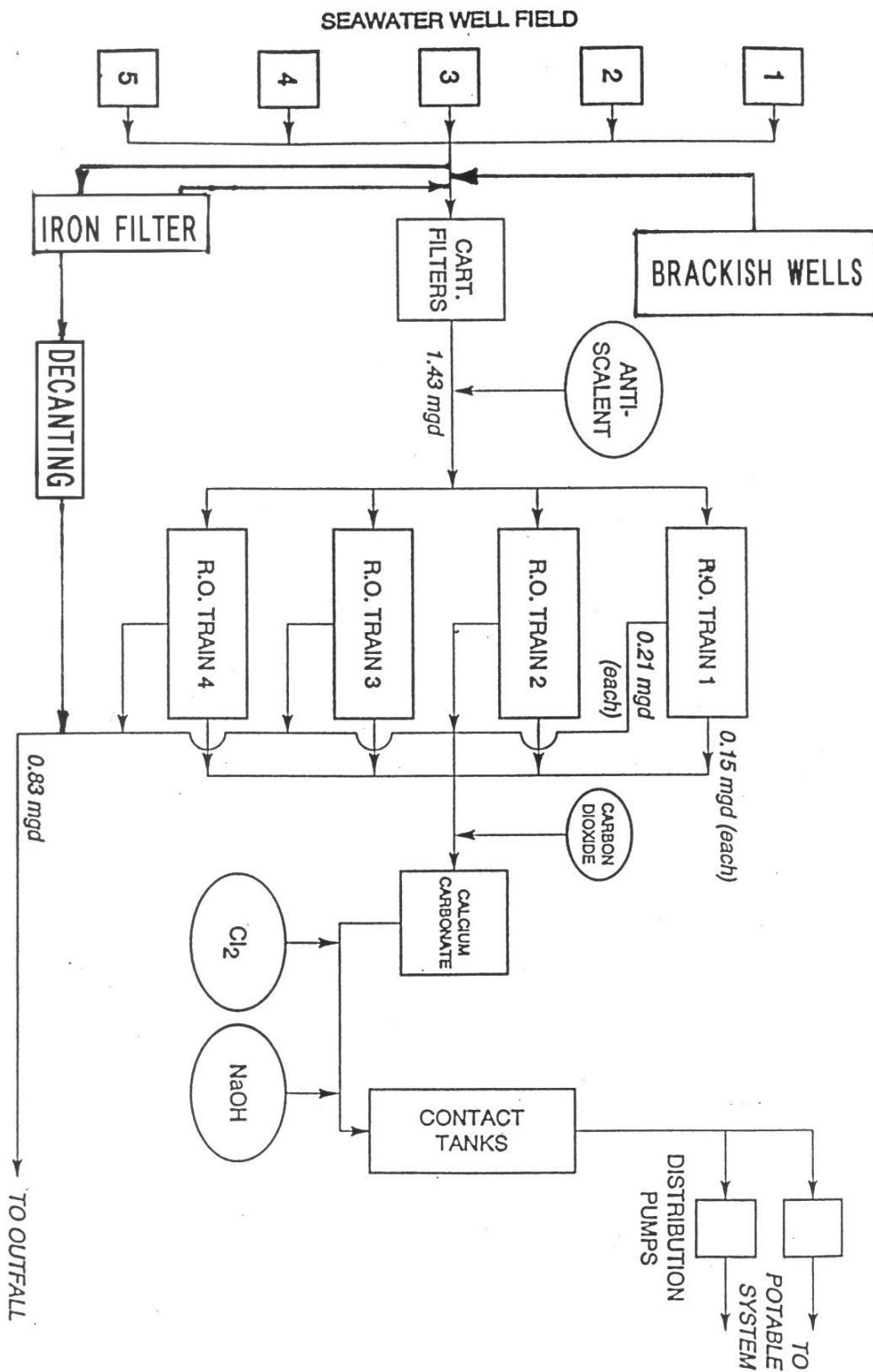
I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region, on May 14, 2004.

Executive Officer

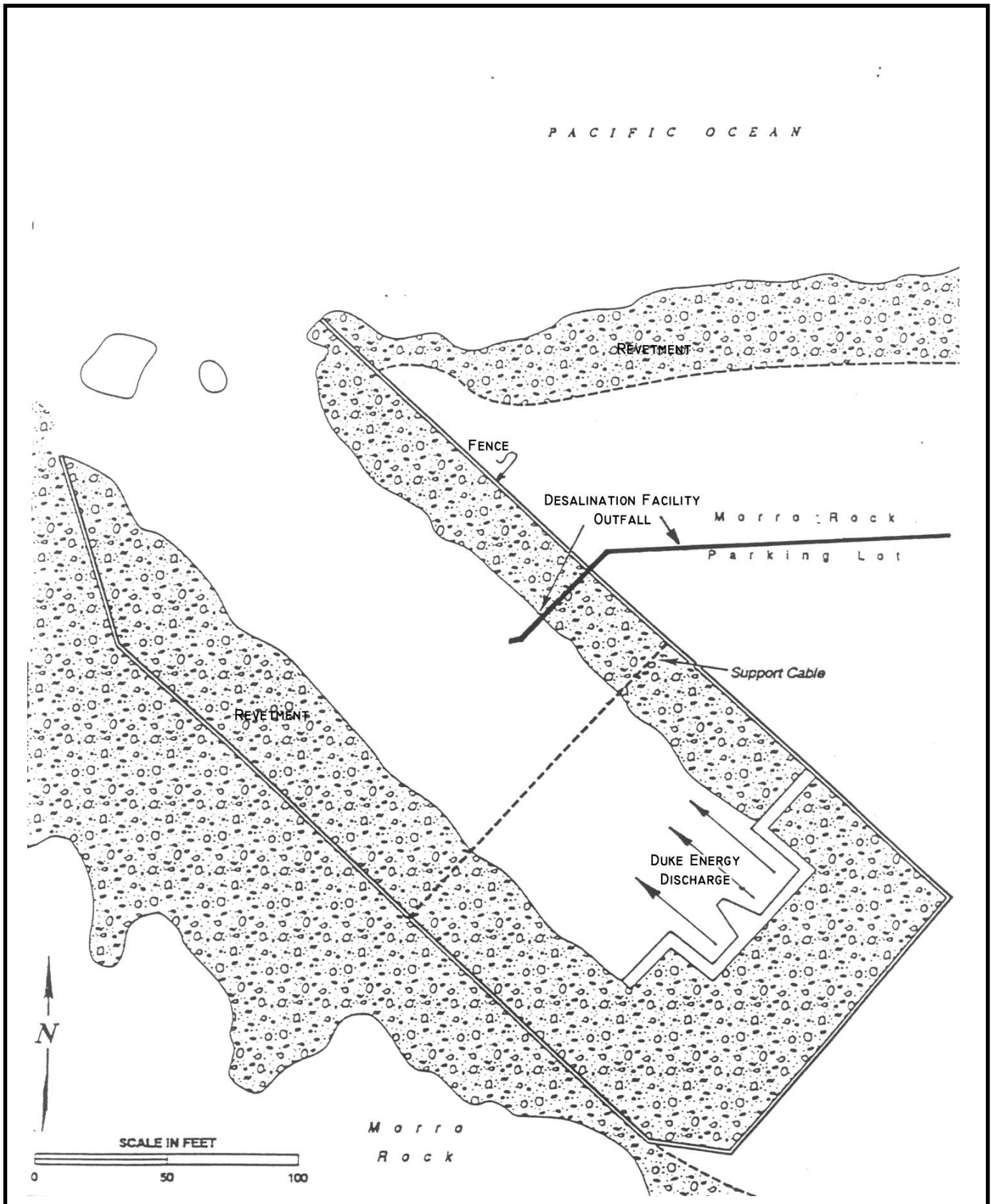
Date



Attachment A
Location and Facility Map
City of Morro Bay Desalination Facility



Attachment B
Flow Schematic
City of Morro Bay Desalination Facility



Attachment C
Discharge Location
City of Morro Bay Desalination Facility